In the Claims:

Following is a complete listing of the claims pending in the application, as amended:

Please cancel claims 1-33 and add new claims 34-63.

Claims 1-33 (Canceled)

34. (New) A tool for electrochemically depositing copper into submicron micro-recesses on a workpiece having a nonuniform copper seed layer less than 500 Å thick, the apparatus comprising:

an automated robotic transfer mechanism;

a plurality of electrochemical processing stations arranged about the robot so that the robot can automatically transfer workpieces to/from the processing stations, the processing stations having baths containing a plating solution including copper and workpiece holders, and the processing stations being configured to operate in a seed layer enhancement mode in which additional copper is electrochemically deposited onto the workpiece to enhance the seed layer for filling the recesses and a bulk plating mode in which copper is electroplated onto the workpiece until the recesses are filled.

35. (New) The apparatus of claim 34 wherein the electrochemical processing stations include a first processing station configured to operate in the seed layer enhancement mode and a second processing station configured to operate in the bulk plating mode.

36. (New) The apparatus of claim 34 wherein the first electrochemical processing station comprises a first workpiece holder having first electrical contacts and a first bath comprising an alkaline plating solution, and the second electrochemical processing station comprises a second workpiece holder having second electrical contacts and a second bath comprising an acidic plating solution.

37. (New) The apparatus of claim 34 wherein the electrochemical processing stations include at least one processing station that can operate in the enhancement mode to enhance the seed layer and then operate in the bulk plating mode to fill the recesses.

38. (New) The apparatus of claim 34 wherein the electrochemical processing stations include at least one processing station that operates in the enhancement mode by electroplating additional material onto the seed layer.

39. (New) A method of forming copper interconnect structures, comprising:

providing a workpiece having a dielectric layer, a plurality of submicron micro-recesses in the dielectric layer, a first layer that conforms to the submicron micro-recesses, and a copper seed layer that conforms to the first layer, the seed layer being approximately 50Å to 500Å thick and having nonuniformities such that the seed layer is insufficient for filling the micro-recesses;

enhancing the seed layer with additional copper to form a conformal seed layer that covers substantially all of the first layer by electrochemically depositing additional copper onto the workpiece with an alkaline solution containing copper; and

electroplating copper onto the conformal seed layer in an acidic solution containing copper to fill the micro-recesses with copper.

40. (New) The method of claim 39 wherein the alkaline solution includes a polycarboxylic acid.

41. (New) The method of claim 39 wherein the polycarboxylic acid comprises citric acid.

42. (New) The method of claim 39, further comprising rinsing the workpiece after contacting the workpiece with the alkaline solution and before contacting the workpiece with the acidic solution.

43. (New) A method of forming copper interconnect structures, comprising:

providing a workpiece having a dielectric layer, a plurality of submicron micro-recesses in the dielectric layer, a first layer that conforms to the submicron micro-recesses, and a copper seed layer that conforms to the first layer, the seed layer being approximately 50Å to 500Å thick and having nonuniform voids and/or spikes such that the seed layer is insufficient for filling the micro-recesses;

enhancing seed layer uniformity with additional copper and reducing copper oxide on the seed layer to metallic copper to form a conformal seed layer that covers substantially all of the first layer by electrochemically depositing additional copper onto the workpiece with an alkaline solution; and

electroplating copper onto the conformal seed layer in an acidic solution containing copper to fill the micro-recesses with copper.

44. (New) A method of forming copper interconnect structures in submicron micro-recesses on a workpiece having a barrier layer conforming to the micro-recesses and a copper seed layer over the barrier layer, the seed layer being approximately 50Å to 500Å thick and having nonuniformities such that the seed layer is insufficient for filling the micro-recesses, the method comprising:

adhering additional copper to any exposed areas of the barrier layer and the seed layer to enhance uniformity of the seed layer by contacting the workpiece with a first solution containing copper to form a conformal seed layer that covers substantially all of the barrier layer; and

filling the micro-recesses by electroplating copper over the conformal seed layer in a second solution containing copper, wherein the first solution is different from the second solution.

45. (New) A method of forming copper interconnect structures in submicron micro-recesses on a workpiece having a barrier layer conforming to the micro-recesses and a copper seed layer over the barrier layer, the seed layer having a thickness of 50Å to 500Å, and the seed layer being a nonuniform layer insufficient for filling the micro-recesses in a bulk plating operation, the method comprising:

adhering additional copper to the seed layer and any exposed areas of the barrier layer and reducing copper oxide on the seed layer to metallic copper by contacting the workpiece with a first solution containing copper to form a conformal metallic copper seed layer that covers substantially all of the barrier layer; and

filling the micro-recesses by electroplating copper over the conformal seed layer in a second solution containing copper, wherein the first solution is different from the second solution.

46. (New) A method of forming copper interconnect structures in submicron micro-recesses on a workpiece having a barrier layer conforming to the micro-recesses and a copper seed layer over the barrier layer, the seed layer having a thickness of 50Å to 500Å, and the seed layer being a nonuniform layer insufficient for filling the micro-recesses in a bulk plating operation, the method comprising:

reducing copper oxide on the seed layer to metallic copper and adhering additional copper to any exposed areas of the barrier layer to fill any voids within the seed layer by contacting the seed layer with a first solution containing copper to form a conformal metallic copper seed layer that covers substantially all of the barrier layer; and

electroplating additional copper over the conformal seed layer to fill the micro-recesses by contacting the workpiece with a second solution containing copper, wherein the second solution is different than the first solution.

47. (New) The method of claim 46 wherein the first solution comprises an alkaline solution.

48. (New) The method of claim 46, further comprising rinsing the workpiece after reducing the copper oxide on the nonuniform seed layer to metallic copper and before electroplating additional copper over the conformal seed layer in the second solution.

49. (New) The method of claim 46 wherein the first solution is an alkaline solution containing citric acid.

50. (New) A method of forming copper interconnect structures in submicron micro-recesses having widths less than 0.5 μm on a workpiece having a barrier layer conforming to the micro-recesses and a copper seed layer over the barrier layer, the seed layer having a thickness of 50Å to 500Å, and the seed layer being a nonuniform layer insufficient for filling the micro-recesses in a bulk plating operation, the method comprising:

reducing copper oxide on the seed layer to metallic copper and filling any voids within the nonuniform seed layer by contacting the nonuniform seed layer with a first solution containing copper to form a conformal seed layer that covers substantially all of the barrier layer; and

electroplating additional copper over the conformal seed layer to fill the micro-recesses by contacting the workpiece with a second solution containing copper, wherein the second solution is different than the first solution.

51. (New) A method of forming copper interconnect structures, comprising:

providing a semiconductor workpiece having a dielectric layer, a plurality of submicron micro-recesses having a width less than 0.5 μm in the dielectric layer, a barrier layer that conforms to the micro-recesses, and a copper seed layer over the barrier layer, the seed layer having a thickness of approximately 50Å to 500Å, and the seed layer being a nonuniform layer;

enhancing the uniformity of the seed layer by depositing additional copper onto the seed layer in an alkaline solution containing copper;

removing the workpiece from the alkaline solution and rinsing the workpiece; and

filling the micro-recesses with copper by electroplating copper into the micro-recesses in an acidic solution containing copper.

52. (New) The method of claim 51 wherein the alkaline solution includes a polycarboxylic acid.

53. (New) The method of claim 51 wherein the polycarboxylic acid comprises citric acid.

54. (New) The method of claim 51, further comprising reducing copper oxide on the nonuniform seed layer to metallic copper and adhering additional copper to exposed areas of the barrier layer.

55. (New) A method of forming copper damascene interconnect structures, comprising:

providing a workpiece having a dielectric layer, a plurality of trenches having submicron widths, a barrier layer conforming to the trenches, and a copper seed layer over the barrier layer, the seed layer having a thickness of 50Å to 500Å, and the seed layer being a nonuniform layer;

contacting the seed layer with an alkaline solution containing copper to form a conformal seed layer that covers substantially all of the barrier layer;

removing the workpiece from the alkaline solution;

rinsing the workpiece;

electroplating the conformal copper seed layer in an acidic solution to fill the trenches with copper; and

planarizing the workpiece to form inlaid copper lines in the trenches.

56. (New) The method of claim 55 wherein the alkaline solution includes a polycarboxylic acid.

57. (New) The method of claim 55 wherein the polycarboxylic acid comprises citric acid.

58. (New) The method of claim 55 wherein contacting the seed layer with an alkaline solution further comprises reducing copper oxide on the seed layer to metallic copper.

59. (New) The method of claim 55 wherein contacting the seed layer with an alkaline solution further comprises adhering additional copper to areas of the barrier layer exposed within voids of the seed layer.

60. (New) The method of claim 55 wherein contacting the seed layer with an alkaline solution further comprises reducing copper oxide on the seed layer to metallic copper and adhering additional copper to the barrier layer.

61. (New) A method of forming copper interconnect structures, comprising:

providing a workpiece having submicron micro-recesses with widths less than 0.5 μm and a nonuniform copper seed layer with a thickness of 50Å to 500Å;

enhancing the seed layer by adding copper to the workpiece to produce an enhanced seed layer having better uniformity than the nonuniform seed layer; and

electroplating additional copper over the enhanced seed layer to form a plated copper layer that fills the recesses by contacting the workpiece with a plating solution containing copper in the presence of an electric field, wherein the non-uniformity standard deviation of the plated copper layer is less than approximately 7%.

62. (New) The method of claim 61 wherein the non-uniformity standard deviation of the plated copper layer is approximately 6%.

63. (New) The method of claim 61 wherein the enhancement of the seed layer reduces the non-uniformity standard deviation of the plated copper layer to a value less than approximately 15% of a non-uniformity standard deviation for a copper layer plated onto a seed

layer having the same characteristics as the nonuniform copper seed layer before enhancement.